

WE CLAIM:

1 1. A digital image system, comprising:
2 a digital image sensor including at least an array of photo-detectors having one
3 or more repeat units therein, each said repeat unit including at least one single-color photo-
4 detector capable of detecting a luminance value and a two-color photo-detector capable of
5 detecting first and second chrominance values; and
6 interpolation logic connected to receive said detected luminance value and
7 interpolate at least one interpolated luminance value associated with said two-color photo-
8 detector, said interpolation logic being further connected to output said detected luminance
9 value without interpolating said first or second chrominance value associated with said
10 detected luminance value.

1 2. The system of Claim 1, wherein said luminance value is associated with the
2 intensity of light within a first range of wavelengths, said first chrominance value is associated
3 with the intensity of light within a second range of wavelengths and said third chrominance
4 value is associated with the intensity of light within a third range of wavelengths.

1 3. The system of Claim 2, further comprising:

2 output logic connected to receive said detected luminance value, said detected
3 first and second chrominance values and said interpolated luminance value and output at least
4 one group of color values including four output luminance values, one first output
5 chrominance value and one second output chrominance value, at least one of said four output
6 luminance values being derived from said detected luminance value or said interpolated
7 luminance value, said first output chrominance value being derived from said first chrominance
8 value and said second output chrominance value being derived from said second chrominance
9 value.

1 4. The system of Claim 3, wherein said interpolation logic and said output logic
2 are included within said digital image sensor.

1 5. The system of Claim 3, wherein said four output luminance values, said first
2 output chrominance value and said second output chrominance value are directly compressed
3 with no additional processing.

1 6. The system of Claim 3, further comprising:

2 chrominance processing logic connected to receive said detected first and
3 second chrominance values and produce said first output chrominance value and said second
4 output chrominance value.

1 7. The system of Claim 6, wherein said chrominance processing logic is capable of

2 subtracting said interpolated luminance value from said first chrominance value to produce
3 said first output chrominance value.

1 8. The system of Claim 6, wherein said chrominance processing logic is further

2 connected to receive additional detected first and second chrominance values, said
3 chrominance processing logic averaging said detected first chrominance value and said
4 additional detected first chrominance value to produce said first output chrominance value and
5 averaging said detected second chrominance value with said additional detected second
6 chrominance value to produce said second output chrominance value.

1 9. The system of Claim 3, wherein said single-color photo-detector for said repeat

2 unit comprises a first single-color photo-detector capable of detecting a first luminance value
3 and a second single-color photo-detector capable of detecting a second luminance value.

1 10. The system of Claim 9, wherein said at least one interpolated luminance value
2 comprises a single interpolated luminance value associated with said two-color photo-
3 detector.

1 11. The system of Claim 9, wherein said at least one interpolated luminance value
2 comprises first and second interpolated luminance values associated with said two-color
3 photo-detector.

1 12. The system of Claim 11, wherein said four output luminance values are derived
2 from said first and second interpolated luminance values and said first and second detected
3 luminance values.

1 13. The system of Claim 3, wherein said single-color photo-detector for said repeat
2 unit comprises a first single-color photo-detector capable of detecting a first luminance value,
3 a second single-color photo-detector capable of detecting a second luminance value and a
4 third single-color photo-detector capable of detecting a third luminance value.

1 14. The system of Claim 13, wherein said four output luminance values are derived
2 from said first, second and third detected luminance values and said interpolated luminance
3 value.

1 15. A digital image system, comprising:
2 a digital image sensor including at least an array of photo-detectors having one
3 or more repeat units therein, each said repeat unit including at least one single-color photo-
4 detector capable of detecting a luminance value and a two-color photo-detector capable of
5 detecting first and second chrominance values; and
6 interpolation logic connected to receive said detected luminance value and
7 interpolate at least one interpolated luminance value associated with said two-color photo-
8 detector, said interpolation logic being further connected to assign said first and second
9 chrominance values to said detected luminance value and output said detected luminance value
10 and said first and second chrominance values.

1 16. The system of Claim 15, wherein said luminance value is associated with the
2 intensity of light within a first range of wavelengths, said first chrominance value is associated
3 with the intensity of light within a second range of wavelengths and said third chrominance
4 value is associated with the intensity of light within a third range of wavelengths.

1 17. The system of Claim 16, further comprising:

2 output logic connected to receive said detected luminance value, said detected
3 first and second different chrominance values and said interpolated luminance value and output
4 at least one group of color values including four output luminance values, one first output
5 chrominance value and one second output chrominance value, at least one of said four output
6 luminance values being derived from said detected luminance value or said interpolated
7 luminance value, said first output chrominance value being derived from said first chrominance
8 value and said second output chrominance value being derived from said second chrominance
9 value.

1 18. The system of Claim 17, wherein said interpolation logic and said output logic
2 are included within said digital image sensor.

1 19. The system of Claim 3, wherein said four output luminance values, said first
2 output chrominance value and said second output chrominance value are directly compressed
3 with no additional processing.

1 20. The system of Claim 17, further comprising:
2 chrominance processing logic connected to receive said detected first and
3 second chrominance values and produce said first output chrominance value and said second
4 output chrominance value.

1 21. The system of Claim 20, wherein said chrominance processing logic is capable
2 of subtracting said interpolated luminance value from said first chrominance value to produce
3 said first output chrominance value.

1 22. The system of Claim 20, wherein said chrominance processing logic is further
2 connected to receive additional detected first and second chrominance values, said
3 chrominance processing logic averaging said detected first chrominance value and said
4 additional detected first chrominance value to produce said first output chrominance value and
5 averaging said detected second chrominance value with said additional detected second
6 chrominance value to produce said second output chrominance value.

1 23. A method for processing raw digital color image values, comprising:
2 providing an array of photo-detectors on a digital image sensor, said array of
3 photo-detectors having one or more repeat units therein, each said repeat unit including at
4 least one single-color photo-detector capable of detecting a luminance value and a two-color
5 photo-detector capable of detecting first and second chrominance values;
6 interpolating at least one interpolated luminance value associated with said
7 two-color photo-detector; and
8 processing said detected luminance value without interpolating said first or
9 second chrominance value associated with said detected luminance value.

1 24. The method of Claim 23, further comprising:
2 outputting at least one group of color values including four output luminance
3 values, one first output chrominance value and one second output chrominance value, at least
4 one of said four output luminance values being derived from said detected luminance value or
5 said interpolated luminance value, said first output chrominance value being derived from said
6 first chrominance value and said second output chrominance value being derived from said
7 second chrominance value.

1 25. The method of Claim 24, further comprising:

2 compressing said four output luminance values, said first output chrominance
3 value and said second output chrominance value directly with no additional processing.

1 26. The method of Claim 24, further comprising:

2 subtracting said interpolated luminance value from said detected first
3 chrominance value to produce said first output chrominance value.

1 27. The method of Claim 23, further comprising:

2 detecting additional first and second chrominance values;
3 averaging said detected first chrominance value and said detected additional
4 first chrominance value to produce said first output chrominance value; and
5 averaging said detected second chrominance value with said detected additional
6 second chrominance value to produce said second output chrominance value.